Light

Warming

&

Ventilation.

Dear Dr 5. 10. 79.

I think the plan Excellent. I would suggest under "construction" or "warmth" the inconvenience (as I find every critic) of 2, 3 or 4 rooms tapping one heat flue, & the evils of a large ash-bin in the cellar. In Ventilation the value of grates. In Drainage you will of course allude to the ventilation of the water closet by suction, down-draft & the imperfection of water-traps. In water-supply the value of inside plumbing to avoid freezing (which I have never yet had) also in Drainage to the value of exposed instead of covered drains - the need of water supply to heated air - the passage of CO_2 thro' cast iron - the care of Country & seaside Houses as well as those in the City.

Yours truly W. W. Keen

WRITE THE ADDRESS ON THIS SIDE—THE MESSAGE ON THE OTHER

Dr Hartshorne

11 E. Penn St

Germantown

Construction of Houses for Health.

(~~See last page of notes~~)

Of materials — hygienically regarded, wood is unobjectionable; — being permeable to air & moisture, — while, if tightly put together, it will shut out dampness, as well as rain, almost as effectually as brick walls. For extempore hospitals during the war, one story buildings, of wood, raised above the ground, & with shade or an attic to keep excessive sun-heat from the wards, answered well.

Brick is somewhat porous, allowing air & moisture to pass slowly. Stone is less so, — but, all things considered, the best material probably for houses. Double walls, of any material, are better for extremes of temperature than very thick walls; the air between being the best non-conductor. Double sashes, also, a good arrangement, especially for winter. Proportions of rooms & houses ought of course, for health, to be spacious, for air-purity. Plenty of windows and doors secure circulation of air, & light. Foundations & Cellars, must be dry. Dampness of a cellar is a fatal fault in a house. Artificial flooring may correct it if slight. Zinc over it, next best. For floors, wood, or tiles; stone, only in hot climates. Roofs best double & sloping. Sources of dampness in a house, — ground, roof, walls, & condensation.

Prof. Doremus (Buffalo? Medical College)

lately: a block of building sandstone, 12 in long by 4 or 5, with a panel ½ inch deep sunk on each side; in each panel a block, perfor. by gas-pipe, cemented at edges; the whole then coated with imperious varnish. Blow out candle through it. Pressure of gas of house supply sent through enough to light burn.

2 parts coal tar
1 part pitch, &
to each bucketful, 3 handfuls
of Quicklime.
For waterproofing foundations
of houses. —

Matt. 16. 26 wha

John. 14. 27 — Peac
& 30 — hath

John 16. 33 — I have

1 Cor. 2. 12 we hav

Eph. 5. 14 — world c

Is. 1. 27 with the

Light, —

Warming, —

&

Ventilation.

(F. Winslow "On the Influence of Light") **Light.** (1)

Hippocr. said - "Old men double their age in winter, and rejuvenate in Summer." This, so far as it is true, must be ref. to conjoint action of light & heat. The ancient Romans had terraces on their houses called "solaria" to bask in sun and air. The younger Pliny wrote of his uncle, the great naturalist, "If he had leisure in summer after dinner, he would lie down in the sunshine."

The influence of light on vegetable life is indispensable; on animal life it is important. The development & transformation of tadpoles, for instance, is delayed, if not arrested, by darkness. In the Mammoth Cave of Kentucky there are very few animals, and these few are mostly blind. Some beetles, of a dingy black or colour, in exclusion of light are said to be white; & so are the under sides of flatfishes; — and the larvæ of insects that burrow in the earth, or in fruits or nuts. Men living in underground mines never have good health. Temporary seclusion in darkness is said to favor the fattening of poultry when well fed; but even this fattening is not ~~necessarily~~ a sign of good health. Actinism is a term applied to the chemical influence of light which (as in photography) is a property possessed by some rays which are scarcely luminous to the eye; and these actinic rays probably have influence upon animals & men. Exp. Photographic paper opens, turns waterfully under blue. M. Bert, &c.

"Where the sun never enters, the physician enters often." Statesman proverb

(3)

Excess of light, however, may cause injury to sight, — even blindness.

Hemeralopia (seeing only in daylight) occurs not very rarely among persons exposed for some time to glare — as at sea or in the tropics — over a chalk formation in parts of France near the sea — & among soldiers marching over sand or snow. — It is said (H. W. Williams of Boston) to be cured by repose of the eyes for some days in total darkness — gradually coming out. Sudden emergence is distressing. Dionysius the ancient tyrant is said to have punished prisoners by obliging them to come at once from darkness into whitewashed, unroofed rooms.

Every hat & a house (access to recess in attic) to be used by day.

Snow & ice-blindness are not uncommon in the Arctic regions.

Photophobia of moderate degree is best met by plain — if severe, by blue glasses. Either will also shield the eye from the wind and dust. Glasses protect from the glare of artificial lights. But (unless lenses are needed), they should be removed when reading.

In Liverpool, not many years ago, 30,000 people lived in cellars.

The Cur. claims report of Thos. Smith in 1849.

Summer shipment class acres of cellars.

2

Iron in Sunbeam! Humbug

Neuralgia (Hand to my self
cures

Sun Bath! —

* Thus Shakespeare, in Othello:

"It is the very error of the moon;
She comes more near the earth than she was wont,
And makes men mad."

"Moon-struck madness" — Lost
Milton, Paradise

Blackstone's Commentaries, defin. of non-compos mentis
speak of the influence of the moon

~~minds~~

Dy: Dr. L. Lavin '69

M. Buffalo 5 can

Chelsea a shaft lines

1 st for 1 alumny.

A ship in N. Orl. 8

can U. for to 1, Miss

Miss Hartleyle 58 too of

Shady side Chopin Song

she says, — axis 1 wind should be N. & S. "

n ft, Pleasing to off

the enpan forbaken

Shady side hospitalities

— over —

Allan Barnickel —

Bacteria.—Dr. Arthur Downes and F. P. Blount, Esq., have presented to the Royal Society the result of somc most interesting observations on the effect of light on bacteria and other organisms. The record is too long to be given in full, but the deductions may be summed up as follows:

1. Light is inimical to the development of bacteria, and the microscopic fungi associated with putrifaction and decay.

2. Under favorable condition it wholly presents that development, but under less favorable it may only retard.

3. The preservative quality of light, as might be expected, is most powerful in the direct solar rays, but can be demonstrated to exist in ordinary diffused daylight.

4. So far as investigated it would appear that it is chiefly but perhaps not entirely, associated with the actinic rays of the spectrum.

5. The fitness of a cultivation liquid, to act as a nidus, is not impaired by insulation.

6. The germs originally present in such a liquid may be wholly destroyed, and a putrescible fluid perfectly preserved by the unaided action of light.

In 1881 all the students in the regular course will [illegible] Greek.

— The appropriation of $2,000 for improving the public grounds on Central Hill, Somerville, was non-concurred in by the aldermen. It was voted, however, to reduce the salaries of school teachers from $6,500 to $6,200.

— The winter term of the High School at Brockton finished Friday, March 8, with exercises by the middle class, consisting of a duet, essays, declamations, recitations, and dialogues.

— It is found that there are 156 salaried officials who will have to resign or move into town, in case the pending order that all employees of the city must be citizens of Boston, is adopted. All but 30 are connected with the schools.

— The Hon. Clark Jillson, of Worcester, will deliver the poem at the next reunion of Nichols Academy alumni, at Dudley, in June.

— Next year an elective in German literature will be given by Professor Bartlett, of Harvard. The course will begin with Lessing (1750), and embrace the German classic writers to the present day.

— The exhibition of the Worcester Art Society, which was booked for March 8, and the succeeding eight or ten days, was

~~Every part of a house, which the sun can reach, should be allowed to have the sun's rays put it every day.~~

Back, cover

4

Door!

~~never mind freckles!~~

~~It has been said "where the sun enters the physician enters often" & the sun enters under any bedroom door!~~

~~Vapor of sun! (windows)~~

Even lunar influence has been thought by a good many persons of intelligence to be important "Lunacy." Asthma — gravel — hemorrhages & attacks of fever at full moon.

Hospital

Wood — good ventila — one story with shed

elev. from ground, will dry easier — walls not thick, but double — brick — porous — stone — proportions, space

Plenty of windows — doors — foundations — cellar

grate — charcoal — zinc (Bacquel) — for floors — wash over brick — or tiles. — Roofs south — & Drainage — tiles &c — slopes

Sources of dampness in a house: ground, — roof, — walls, & condensation

Plastering — (See Watson's Notes)

Ventilation —

~~Ammonia cure of pneumonia in hot climates~~

~~Cured at once by direct rays of sun —~~

Barracks — Tents — Camps

Hospitals

Mary Jno. Hunt

Heating Houses

The oldest contrivance that we know of among the Romans was for Heating — (1)

1st — Simple focus or clibanum.

2. Hypocaust of ancient Romans — (Dr J. Mason, Discourse at N.Y. Hosp. Feb. 1857)

Derived from brick-kiln — mason-work with flues for diffusion of heat — no provis for withdr. of smoke or vapor. First used for bathing rooms, then for private dwellings.

No chimney — mouth at the outer wall — thro which smoke passed as from an oven.

Subject to leakage — Emperor Julian, by lock & exhala into his chamber, was overpowered by smoke & only saved by being taken out — Emperor Jovian was so suffocated —

Even in ancient times the focus & brazier were preferred, The malt-kiln is now a hypocaust.

Diocletian's palace, Spires (Kitto)

Said by Hans Egede, a missionary writer quoted by Hammond, to have been used in a Dominican convent in Greenland, as early as the 14 century!

Per Martin Triewald, a Swede, used hot water pipes to heat a greenhouse, 1716,

(Focus was in the centre of the room; so usually was the *chibarium* or brazier.)

In castles of English Normans, &c, of Middle ages, the fire was moved to a deep recess against the wall: make fireplace vent or hole in roof, or open lantern, or louvre window at side.

Chimneys invented by the *Italians*, end part of 14th century. Most improvements, in that and the following century, began in Italy.

Water-stove, quite probably first used by ancient Egyptians for hatching eggs. In modern Europe, introduced into France in later part of last century as (Bonnemain's) Chicken Stove.

for dwellings, first in England (by Marquis of Chabannes) about 1816 ~~in latter~~ ~~century~~.

Steam apparatus for warming, only an adaptation of boiler of steam engine. Watt used it to warm his office 1784–5, ~~letting~~ the steam escape & lose its latent heat. Boulton used it further, 1795, with metallic pipes, in Birmingham. Hoyle of England, (sooner) 1791, obtained a patent for an arrangement essentially same as that now used. (Swedenborg)

Dr B. Franklin is said to have invented the first stove like the present ones. But it was an open fire in mid-room with air from beneath.

A Paid Pamphlet quotes a Missionary Hans Egede who has been sent in the Dominion Government to Greenland in 14th cent. Burnemin, for hatching chickens

[Correspondence of the Public Ledger.]

Kakelungs, or Swedish Stoves.

GOTENBERG, SWEDEN, April 20, 1874.

MR. EDITOR:—In an old note book, kept by the writer during a tour in North Europe a year or two since, I chanced upon an entry as follows:

"The amount of fuel consumed in warming houses is generally inverse to the amount of cold to be combated."

The truth of the proposition has been strangely and fully confirmed by a more extended and careful examination into the plans of warming adopted in North Europe, and it is with some fear that the facts may seem incredible that this is written for an American journal. To begin with facts, I will mention that we are now living in two rooms of a hotel, one 20 by 20 feet, the other 20 by 15 feet, the ceiling 12 feet high. Opening into these rooms is one common entrance door and a pair of huge folding doors.

The weather during March was cold, even colder than in Philadelphia or New York, and during this month the number of fires used were about *four in a week*, each fire consisting of from eight to ten billets of wood twelve inches long, or about enough to *start* two coal fires in America. The rooms were thoroughly warmed, and the temperature, night and day, never varied five grades or degrees. The quantity of fuel consumed I will place at one-twentieth part of what would, under similar circumstances, have been required to warm the same rooms in America, and yet we pride ourselves on "what we know about house-warming."

I may mention that my son has been here during eight months past, occupying two rooms even larger than those of which the dimensions are given. He purchased last fall one "Fam," about 200 cubic feet of wood, of which on the first of March *one fourth was left* after firing all winter. The warming is done with a kind of stove called a "Kakelung," and so far as your correspondent can judge, on principles that are more scientific than those of our many patent contrivances, whose double function seems to be to consume fuel and stifle the inmates of our dwellings. This last is I know a strong proposition, but it is based upon personal experience, at the end of three months spent in a first-class dwelling (with modern improvements) in Philadelphia last fall. A sense of relief was felt when we escaped again to old foggy England, where patent heaters are unknown.

The fact is, that American people are oblivious to the frightful effects that come from their system of heating, and only become aware of its discomforts and dangers after passing a winter with English grates or the "Kakelung." To return to the last-named system, a "Kakelung" is simply a great stove of masonry, covered with porcelain plates, having usually five flues, through which the gases of combustion must pass up and down, a distance of 30 to 50, or even 60 feet, before escaping into the air. The general principle of their operation is to provide enough material to absorb all the heat from the fire—to conduct the gases through these long flues until their temperature has fallen to a point that no longer gives off heat. The quantity of the material in the "Kakelung" is so great that the temperature from one firing (which is always enough) will not raise the temperature of any part so much that the hands cannot be held upon the outside.

Two hours after a fire is made, and after the wood has burned up and the flue been closed, the "kakelung" begins to get warm on the outside, the light porcelain plates give off their moderate warmth to the atmosphere, in the room, and ten hours later there will not be much difference in the temperature of the stove or of the room.

A "kakelung," instead of being an unsightly obstruction, is so constucted as to constitute an ornamental piece of furniture. Doors open into them in front, where in a kind of closet, with iron shelves, food can be kept warm or warmed. Baking can be done in the furnace for hours after the fire has been burned out. In the Grand Hotel Rydberg, at Stockholm, the writer created some merriment by inquiring whether the "kakelungs" were simply erections to support the mirrors and flowers with which they were adorned.

Now this result in heating which has been described, is in a great measure due to double windows. The conducting power of a thin pane of glass interposed between the external air and that of a warm room, is never imagined until an experiment is tried. Such cooling does no good, it simply costs money, and answers no purpose of ventilation, and, speaking from actual experience, I would rather live in a room hermetically sealed and warmed by a "Kakelung," than in any room into which burned air is conducted from one of our American furnaces. I am well aware of the scientific arguments and explanations that have been put forth in reference to American house-heating. They are good on paper; the practice is what I refer to, and it is without fear of making a mistake, that I assert that any house in Philadelphia can be warmed with one-fourth the amount of fuel, and with twice the comfort, by means of Kakelungs, as with furnaces—if other conditions peculiar to heating here, are at the same time observed.

J. RICHARDS.

NSYLVANIA RAILROAD CO., TREASU-
's Department, Philadelphia, May 2, 1874.
NOTICE TO STOCKHOLDERS.
Board of Directors has this day declared a
nnual dividend of FIVE PER CENT. on the
l stock of the Company, clear of all taxes, pay-
lay 30th.
lay 30th, dividend will be paid to ladies only;
that date they must await their turn with
stockholders.
k Powers of Attorney can be had at the Office
Company. EDMUND SMITH,
Treasurer.

---

74 LUMBERMEN'S INSURANCE COMPANY. 1874
OFFICE,
NO. 427 WALNUT STREET.
UTHORIZED CAPITAL, $500,000.
CHARTER PERPETUAL.
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elphia and vicinity. Risks taken at the
EST RATES consistent with SAFETY, either
RPETUAL or TEMPORARY policies.
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PH H. COLLINS, JOSEPH J. WILLIAMS
ES R. GATES, LEWIS DAVIS.
ARD HOOPES, GEORGE WATSON,
HUGH McILVAIN, PRESIDENT.
O. G. CROWELL, SECRETARY. o§

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TRUST AND SAFE DEPOSIT COMPANY.
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nporary Office, S. E. corner of Chesnut and
streets, until the erection of a fire and bur-
proof building on lots Nos, 316, 318 and 320 Ches-
treet.
osits of money received on interest at three
nt., payable by check, without notice, and at
per cent., payable by check, on ten days'
. Interest, as may be agreed upon, allowed
ge sums deposited to remain a specified time.
Company is authorized by law to act as Ex-
s, Administrators, Guardians, Assignees, Re-
s, Trustees, Committees, Agents and execute
of every description.
rust investments are inscribed in the name of
rties for whom they are held, and, with the
unds, are kept separate and apart from the
f the Company.
OFFICERS.
AM H. RHAWN, President.
S. BROWN, Vice President and Treasurer.
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DIRECTORS: eod§o

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iam M. Seyfert,	Thomas MacKellar,
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F. Oden Horstmann.

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OBBERY, FIRE OR ACCIDENT.
E FIDELITY INSURANCE, TRUST AND
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OF PHILADELPHIA,
IN THEIR
EW MARBLE FIRE-PROOF BUILDING,
NOS. 329 AND 331 CHESNUT STREET.
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UPON BONDS, STOCKS, SECURITIES, FA-
Y PLATE, COIN, DEEDS and VALUABLES
very description received for safe-keeping, un-
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he Company also Rent SAFES INSIDE THEIR
RGLAR-PROOF VAULTS, at prices varying
m $15 to $75 a year, according to size. An extra
e for Corporations and Bankers; rooms and desks
oining vaults provided for Safe Renters.
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REST, at three per cent., payable by check,
hout notice, and at four per cent., payable by
ck, on ten days' notice.
NCOME COLLECTED and remitted at one per
t.
he Company act as EXECUTORS, ADMINIS-
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HE NAMES OF THE PARTIES FOR WHOM
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OCERIES, TEAS, LIQUORS, ETC.

LT AFLOAT—SALT AFLOAT—14,560 BUS.
urk's Island, 3950 sacks Verdin's fine, 10,850 sacks
rpool ground, now landing and for sale by
ALEX. KERR & BRO.,
126 North Wharves.

RLOW'S INDIGO BLUE.—ORIGINAL AND
unexcelled for Blueing Clothes. Put up at
LTBERGER'S Drug Store, No. 233 N. Second
t, Philadelphia. Every Grocer and Druggist
ld sell it, and every housekeeper buy and use
D. S. WILTBERGER, Prop. tuths16t*

ARKETING.—HOUSEKEEPERS LIVING
even as far south as Walnut and Chesnut find
their interest to market at OXFORD MAR-
T, Oxford and Twentieth streets, by reason of
heapness and excellence. 2t§

O M A T O E S—QUINTON BRAND, THE
finest in flavor, solidity and purity. 1t*

HE BEST AND LARGEST QUANTITY OF
Cider Vinegar in the city, made from apples, by
proprietor, (therefore warranted) and for sale
e gallon or barrel. HENRY KERPER, Main
d Hartwell avenue, Chesnut Hill. 4t*

MATOES—QUINTON SOLD BY PRINCIPAL
Grocers. Buy only Quinton brand. 1t*

MATOES, QUINTON; PRICES REDUCED
o close the season's stock. 1t*

MATOES.—QUINTON WHOLESALE AGEN-
y, 45 North Water street. 1t*

ARL

Open fire places. — "chimney corner" —
wood fires — radiate heat only — fine ventilation
reflection of fire
A border hung on western prairies — big blaze, fire & door open:
have to turn oneself like meat on a spit, to keep the whole body warm
Stoves —
rad. & conduct heat — bottle
ventila. — Dryness — need water over —
Heaters — Latrobe — &
Cellar furnace —
Theoretically well — need
ventilating care — large air chamber, with air from out of doors.
[might have warm air all under the floors, & around walls.]
Best, now, furnace flue (open in entry
as well as room) & low down grate.
~~Why not warm air under floors & return walls?~~
Hot Water pipes (safest & least trouble)
& Steam pipes (very well —
also need arrangements or care for ventilation,

[End of 20th Lecture, 1873]

Overlooked decorization of breath &

Construction of Houses

~~Not here~~

Ventilation —

louvre — open turret — latticed window — chimney, windsail —

rotary centrifugal fan, air pump, & ventilating fire.

Egyptian Pyramid. —

Known of large fire in ventilation was known to the ancients —

Acron, Pythagorean philosph. & physician, nearly a century before Hippocrates, is said to have arrested the spread of an epidemic at Athens by kindling numerous fires in diff. parts of the city (Littre, Oeuvres d'Hippocr. tom. 1, p. 17). Celsus alludes to temporal effects of fire, and heat,

over —

of air & elevated exposure in purifying air of sick rooms.

~~a. Eq. mulgat a Po. tarn bitcoms~~

Agricola, in 16th cent., states that in Germany it was custom-ary to remove foul air from mines by suspending a fire in mid. of shaft, to create an upward current.

Pyramid - also - th

Downward current is a modern invention.

Attic fireplace & flue to remove foul air from small apartments beneath, was first applied to old English Houses of Commons, more than a century ago.

Cristoforo

Ancient Romans used bellows for ventilation.

Rotary or centrif. fan
worked by crank & air
pump in form of immense
pair of bellows, in Germany used to
inject pure air into & force out foul air from mines
in 16th century. A triple
barrelled air pump, worked
with a crank by hand power,
was invented by Dr Desagu-
-liers, in 1727, to remove
impure air from mines of the
Duke of Northumberland; it
could discharge about 10 cub.
ft. of air a minute. The same
philos., Having to remove his ventila-
-ting fire from attic of old
House of Commons, placed

over

in its stead, over the top of the building, the rotary centrifugal fan, which still goes by his name, for drawing up foul air. This was erected 1736, & was in use 84 years. It is still used for ships & factories; can be worked either as forcing or sucking pump. Was once employed in vents of N.Y. Hospital. Dr Hale (of London) is "Ships lungs" invented in last century, sucking a ton of air at a stroke, — was like an immense pair of bellows.

Anon

in removal of foulair, "
introduced by him into
House of Lords, was
afterwards carried out
by Dr. Reid & others,
with the most favorable
results." Daly, however,
appears to have been but
badly remunerated for his trouble
according to an opinion of
the time. "For long 20000
lives the Lords paid
nothing in — their souls!!"

In N.Y. Hospital,
a warming apparatus was intro-
duced (Dec. 1829) 1829.
Dr was formerly employed

by Evelyn; first appl. to Hosp. use by Wm. Strutt, at the Infir-mary of Derby, England. He introduced fresh air thro' an underground culvert 4½ ft. wide 210 ft long, connecting in an upright shaft in open ground near the building; which shaft was covered by a turret cap, the front of which was constantly to the wind. The air entering thro' this tunnel, after being heated by a furnace, ascended upward to the sick rooms, which it reached at openings

(Sutton) A brewer of London in last century, ventilated the holds of ships by cooking fire on deck, drawing up air thro' tubes connected with the ash pit of the fire place.

Sir Geo. Paul, about 1820, ventil. wards of hospital, & foul air from near ceiling of every lower ward being drawn up thro' a flue & conducted thro' the fireplace of the room overhead, to its chimney. (Mr Ewin 1793, erected an upward ventilating current in same manner, substituting a wide metallic pipe for the foul air flue or chimney, & a smaller tube within over

this, instead of the fire) 10

Mr Deacon invented the "Eolian Apparatus" 1813, forcing air from beneath by a fan, thro' earthen or metallic tubes, the sides of which were immersed in boiling water; when thus heated, it was allowed to rise upwards into the dwelling apartments. By using cold instead of hot water, he could temper the air also for summer use.

The gimlet-hole system of ventilating apertures, devised by Sir H. Davy, for equable diffusion of fresh air, & prevent stagnant

Examples illustrating evils of defective ventilation — Dr Ellwood's cases of typh-fever in a very fine house in this city — from a bad privy & waterclosets, — Dr. P. Earle's account of Maplewood Institute in New England — 66 cases of typhoid fever in 77 pupils — from bad privies & ill ventil. dormitories.

Proprietor of a large factory in Manchester, England, having enlarged a working room before bad & ventilated, — soon had to increase the wages of his employés; — on account of their appetites becoming so much better, — it took more to keep them healthy.

So also the members of an Indianapolis dining club, with a raising of the ceiling of their dining room, found their capacity of appropriating their dinners expensively increased.

Dr. E. Harris has publicly expressed the opinion that 55 per cent. of mortality of large cities is from foul air.

Quotation, 1876

As a definite demonstration of such an influence, — at Blackwell's Island Workhouse, N.Y., in 1866, when there were occurring 34 deaths a day from cholera, L. W. Leeds & Dr. T. Hamilton obt. permiss. to remove all the patients, & gave extra blankets to all the well prisoners & turned them out of doors all day; the cholera diminished greatly at once, — & in 6 days disappeared.

Yet, — to show how singular such truths may be misapprehended sometimes, — the Philada. Board of Health, in the summer of 1866, distributed a printed circular of advice thro' the city; — to aid the people to prevent or avoid cholera; one of its injunctions was, — for all families to shut up all their windows at 4 o'clock every afternoon, & keep them closed until 10 o'clock the next morning! (I have a copy of that circular.)

* Gen. Morin asserts that an ordinary sitting-room, occupied, should have its air, if possible, renewed 5 times in an hour.

Ruttan system: what?

Ventilation; renewal of air —

Quantity of air needed —

about a gallon a minute —

(E. Smith) — 350 c. ft à 26 hrs —

700 — 1000 — 1500 — 2500 —

really best, — 1200 to or 3000

but — 2000 c. ft per hour!

fixed upon for amount of supply

really needed for pure habitation

air! ** (Inlet 10 or 11 sq. in. per head outlet same — & chimney besides)

Some school-rooms only 100 cub. ft per scholar!

How get? — Naturally, — by

1st diffusion of gases — constant

& rapid — as continuous —

[action of Trees & Plants also] Artificial available by forced draft —

2d Winds — at sea &c

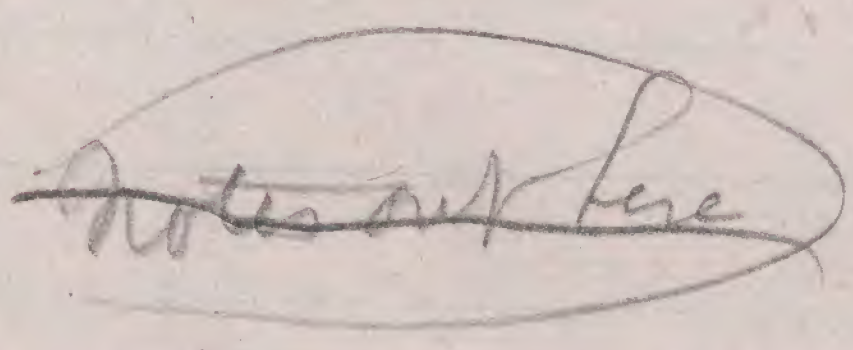
cools — chimney-tops — funnels —

3d — diffusion density of cold &

within buildings — Natural — spontaneous — Artificial —

rapid — ^ — vent. — 4

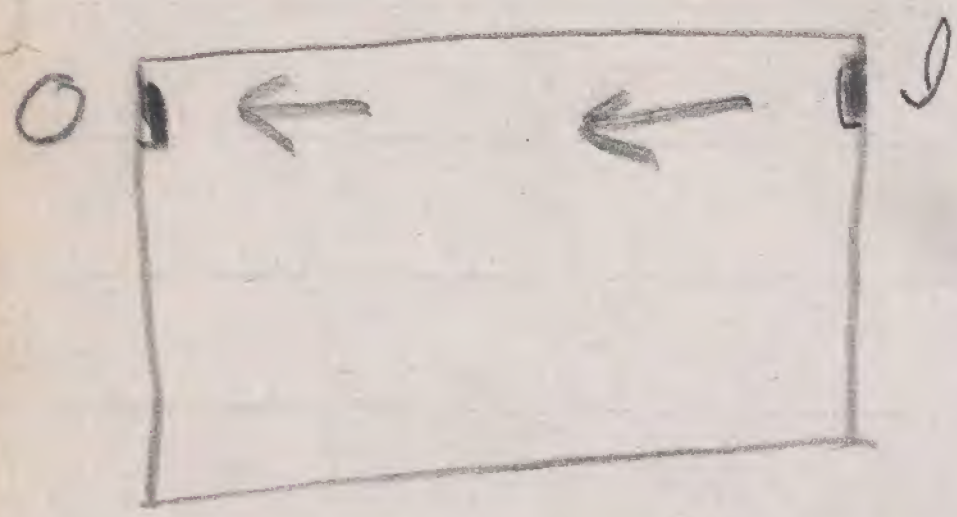
Pretend. of authorities — for natural methods.

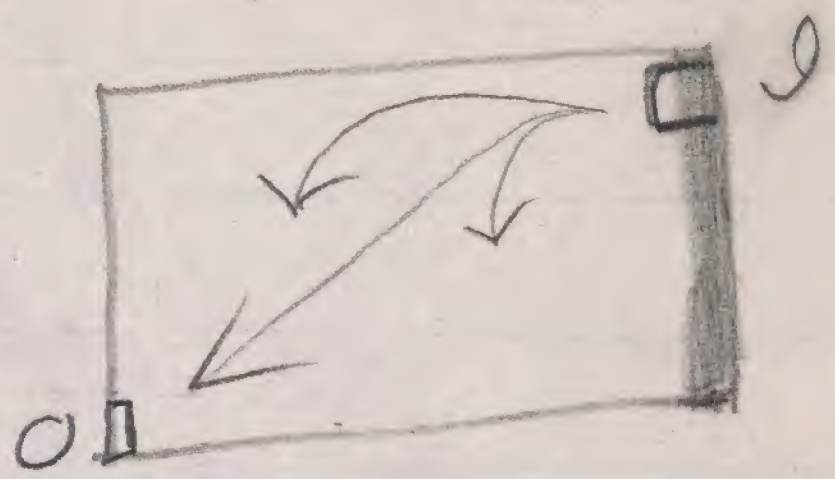


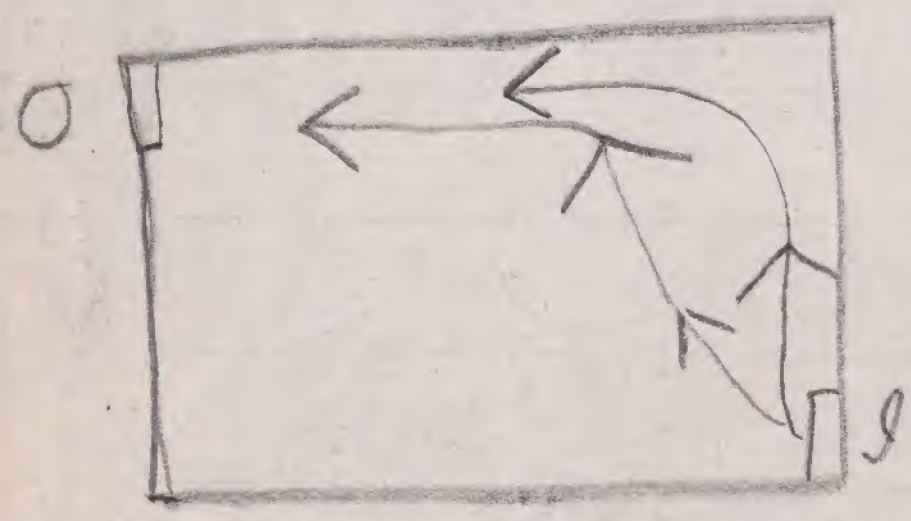
Thus all the Principles of ~~[illegible]~~ ventilation are simple: yet the appliance of them sometimes a complex problem.

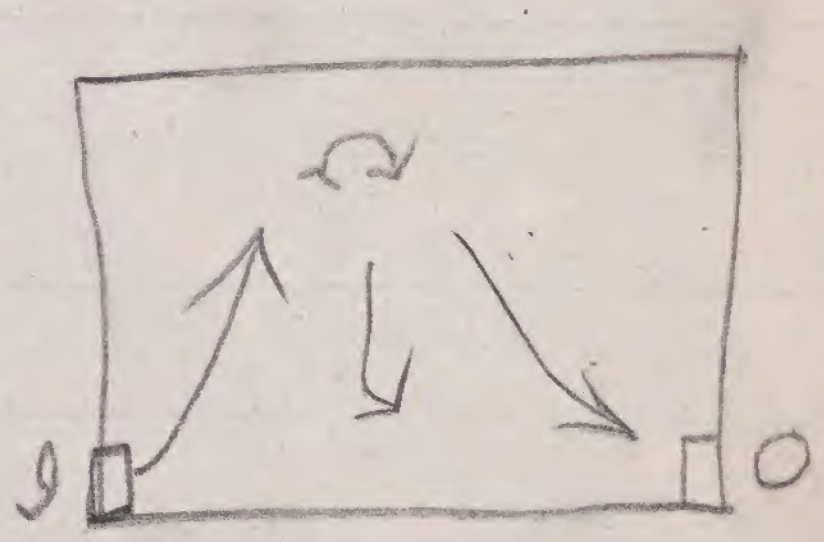
Objects:

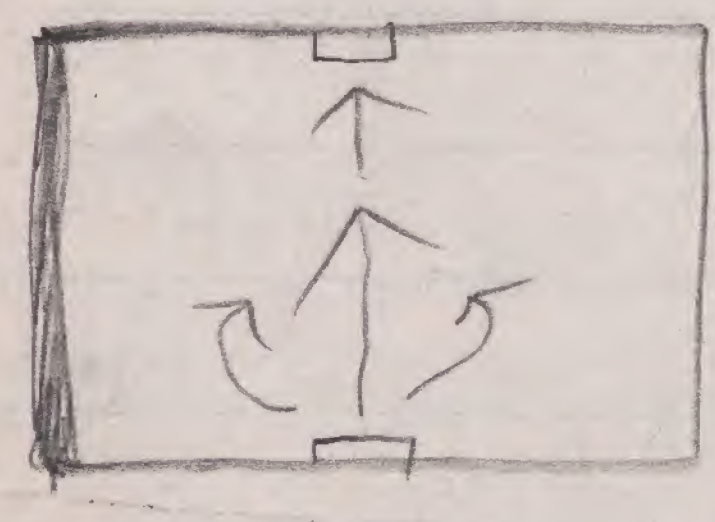
1. That of moving uniformly, through a building, the required amount of pure air.
2. Duly Distributing, that to the different rooms —
3. Properly Diffusing it in each room.
4. Causing removal of vitiated air ~~to depart from~~ ~~[illegible] the ceilings to the~~ all parts of the rooms & buildings.
5. Warming the air in cold weather,
6. Supplying it with moisture.

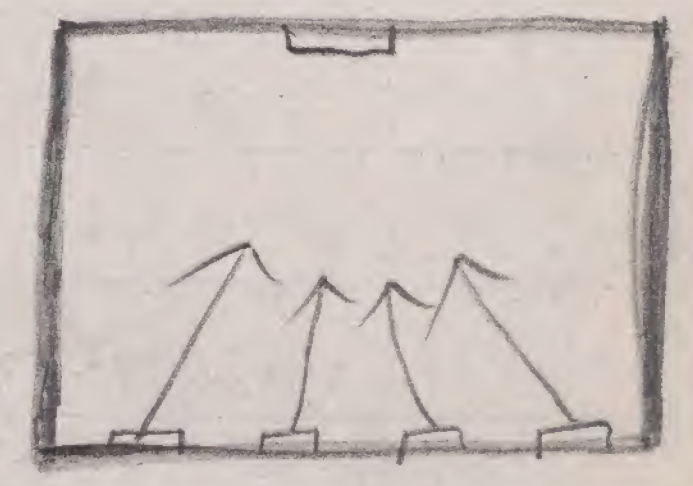


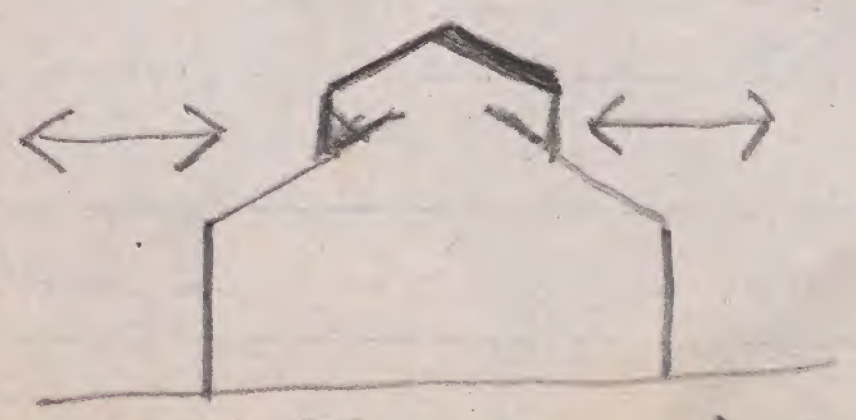












Central Building & Ridge Vent.
Woody & Sankey Depot Mill House.

All these objects to be attained

in 1. Private Dwellings —

2. Schools —

3. Lecture Halls — or Theatres for Concerts &c

4. Church buildings —

5. Theatres —

6. Court Houses — &

Legislative Buildings

Capitols &c

7. Exhibition Places —

8. Libraries Reading Rooms & Museums —

9. Hospitals — 10. Prisons —

11. Almshouses — 12 Barracks —

Guardhouses

13 Manufactories — 14 — Ships & Steamboats

15. Stables — 16 Menageries — 17 Bathhouses

18 Mines — 19. Levees — 20. R.R. Cars —

[Illustrate the "principles" by experiments before class.]

⊗ ↑ Height of Ceilings as to be considered in connection with the principle of the Diffusion of gases.

What becomes of our expired breath?

Up? or down? CO_2 dense — but all warmed. See vapor on frosty day, from nostrils; smoke from cigar or pipe —

Soon smoke descends; breath diffuses!

Some organic matter may be lighter enough to ascend.

Flor. Nightingale — Hammond — & other: current opinion!

Against it — 1st fact of law of diffusion of gases.

Prof. Rogers, about rate & completion of dilution.

2d — dessication & expansion. Cathedrals above —

San Spirito Hosp. at Rome — 70 ft.

2 Hospitals in 1862. — one 30 & one about 19 ft.

Have all ceilings as high as possible.

No Hospital ward less than 20 feet — better 30 feet.

1st Principle — Diffusion of gases

2nd & 3d principles applicable in ventilation both really come under one:

Unequal density of air in its different parts — from diff. of temperature.

Winds (or causes)

Sea breezes — tending toward land all day —

Monsoons — & Trade winds — (Explain)

~~Winds may ventilate or act ventilation~~

(Oceanic Currents likewise.)

High regions of air cold — ~~because far from the earth and therefore rarified~~ rarified by diminished pressure

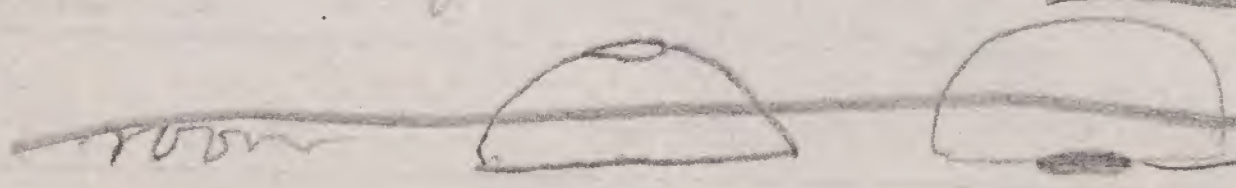
(Heat — expands & lightens air —

Cold descends;

Pouring water or mercury into water.

a man out of doors;

crowd out — doors in hot weather or troops marching.



Fireplace — do Open

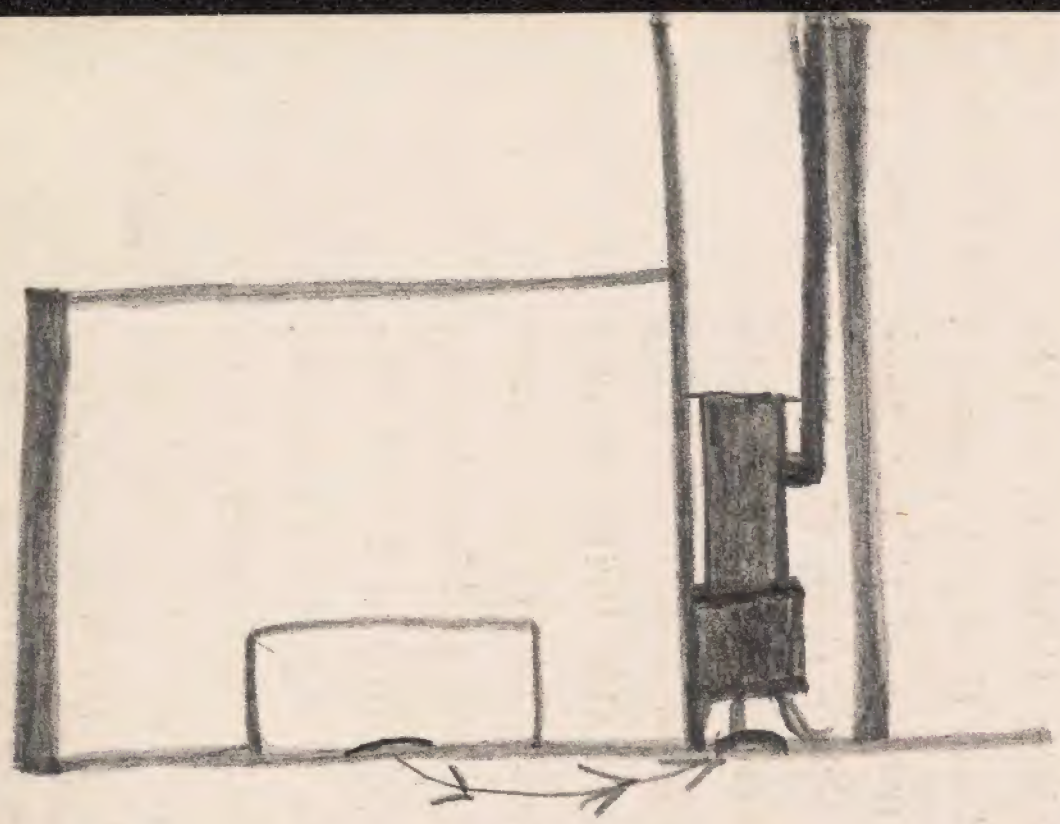
[End of 6th Lecture
1872.]

[End of 21st Lecture
1873]

Omitted by oversight,
last third of page on Light,
about construction of Houses.

Barker's arrangement (show model) is this:
a register is placed at the bottom of an air flue, which runs up to the chimney. In this flue, back of the register, is a parabola-shaped iron hood or reflector, up against which comes, from the heater below, the warm air; — it is, by the reflecting curved surface, thrown out, entering the room only through the upper half of the register. Its heat causes it to tend upward & circulate through the room. On each side of the "hood-reflector," the flue is open, at the top of the register under the heat-inlet. The cooler air of the room, therefore, pours in, or is forced to penetrate into, that part of the register, — & being warmed by the hood, ascends & goes out at the flue. Holman, acting at F. hot. says it is complete.

Unless this work



Ventilation:

1. Spontaneous ("Natural").

2. By Heat-Currents, expressly provided.

3. By Forced Currents (Fans or Pumps).

Thoughts are not always inlets or outlets.
Many small openings are better than one or two large ones.

Perforated pane — Sloping transom — Stick under bottom sash — Mains pipes
Inlet hole admission of warm air —
Warmed Double walls — Floors
Steam or hot water pipes. Dust vented out {nor furnaces with closed rooms

In transmitting to

this copy of my American System for Instruction in German, with my compliments and thanks for numerous favors received from the press, I beg to state that languages, and especially German, can be taught in schools at an earlier age and with greater rapidity than has ever before been thought possible. I have stated to the gentlemen composing the High School Committee that, by means of this system, German could be taught to all the children in the public schools of Philadelphia other than the High School, without additional expense, simply through my devoting one half-hour a week for twelve weeks to the instruction of the young lady pupils at the Girls' High School. At the end of that time they would be competent to teach the book again on becoming themselves teachers in the Primary and Grammar Schools. Commencing with the children's part of the book (pages 139 to 220) in the Primary School, and continuing with the grammar part (pages 19 to 138) in the Grammar School, and employing but twenty minutes twice a week in the former, and thirty-five minutes once a week in the latter, the information thus early imparted, kept up and increased weekly and growing with the pupil's growth, would amount to a considerable store of knowledge and practice, at an age when instruction now-a-days just commences—that is, at the age when the pupil enters the High School. To effect this desirable result, I would cheerfully give my services in teaching the young ladies at the Girls' High School, free of charge to the city, and the authorities could make their own contracts as to the printing of the requisite book or books.

Windows —

Ways of fixing —

double sashes —

sloping sashes attop ~~lower up~~ or transoms

Perfor. plate or —

on pane hinged or sliding — Reversed a little open (reason.)

Mines ventilator.

Slip of wood under open window at bottom; air thro' middle.

~~Height of ceiling.~~ what becomes of our breath? — Expl.

~~Dr. Hammond & others~~

~~Consider that a ceiling may be too high, I do not believe this to be so.~~

~~Sant Spirito, Rome, 70 ft.~~

~~Dr Hopkins in 1862.~~

Dr Franklin — Arnotts, chimney valve — Barker's*

Dr Lewis, Inlets — Outlets —

Total Size — (48 sq. in per bed)

Relative Size — (see over) ? Parkes says outlets larger; Harris needs inlets.

(Position & Direction) —

Inlet — pure air — short tube — wire gauze —

Gen. To change air of a room or ward 5 times an hour (Morin) - needs top of chimney to have 1 sq. in. for every 100 cubic feet of the room or ward, — & fresh air inlet 14 sq. in. for every 100 cub. space, the air is This is however, more than necessary. If changed twice an hour, it will do very well. The need of air change is chiefly according to number of occupants of an apartment.

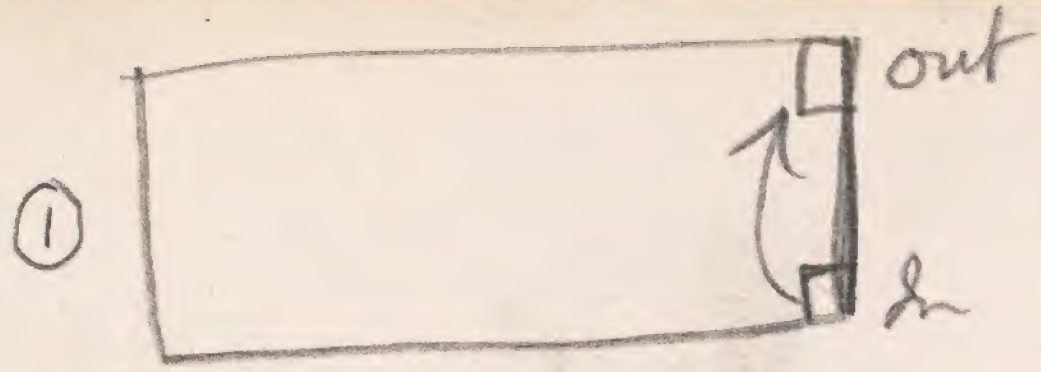
Warmed floor & walls,

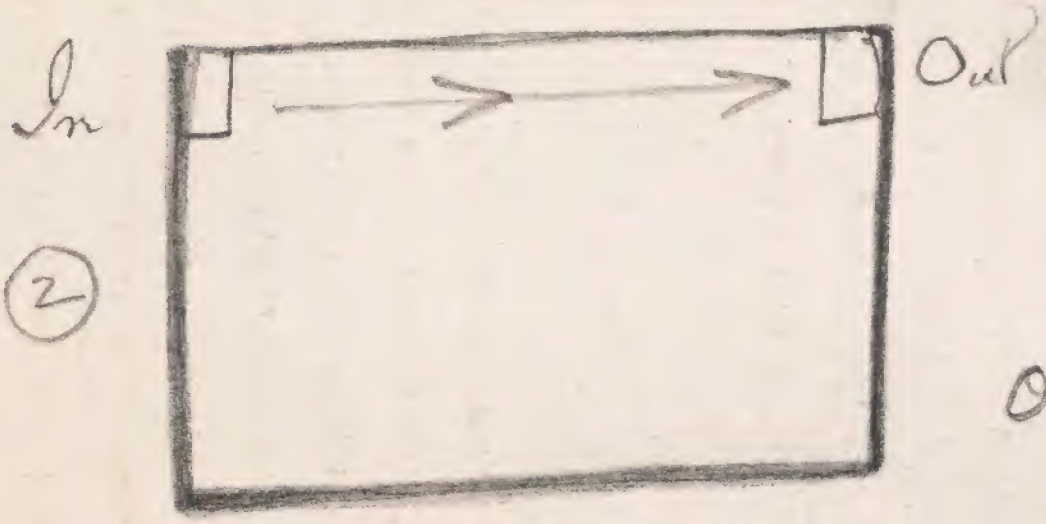
air used for ventil. expens.

One throughlet does not always ventilate; the larger it is, of course the more likely to do so. —

In PRCopi's conservatory, 1878-9, every plant was killed in one night by severe cold, although a warm air flue opened into it, — because there was no outlet to secure air movement through it.

End of 18th Lecture, 1868.


out
1
In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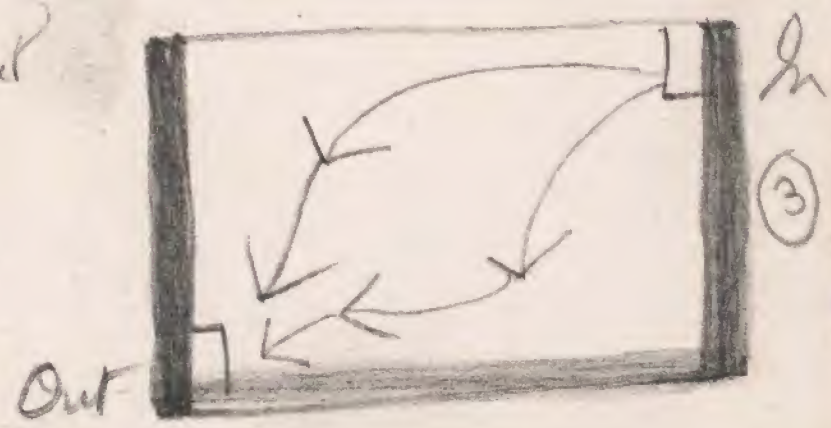
In
3
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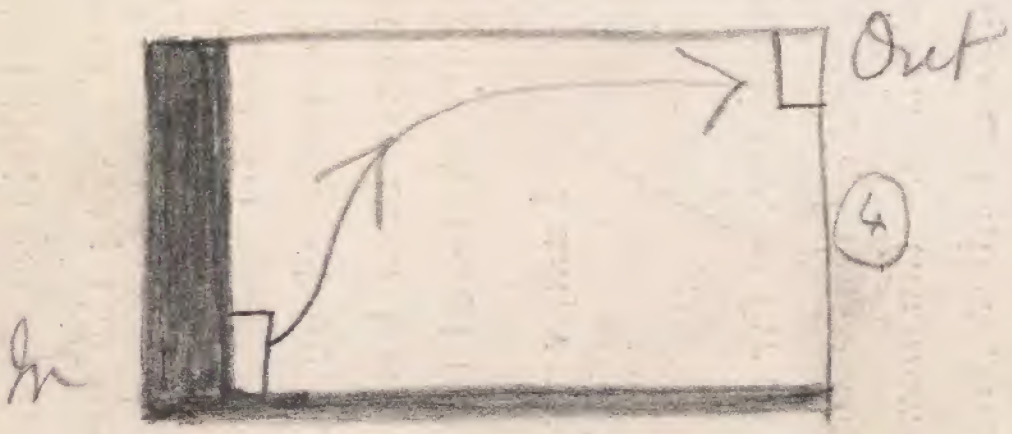
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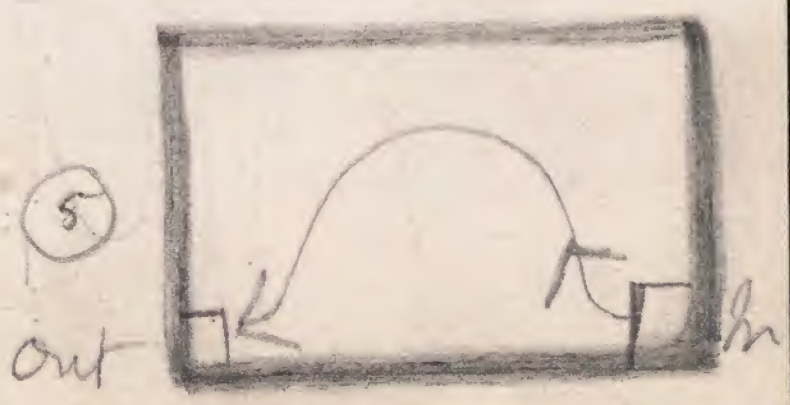
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Out
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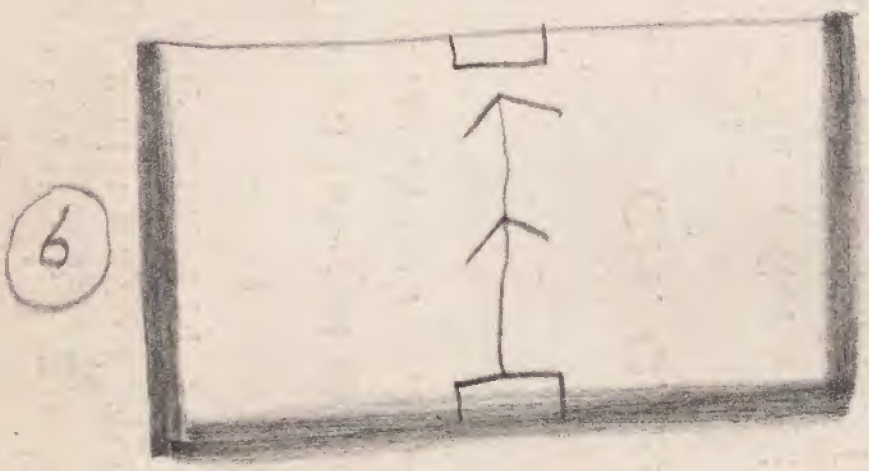
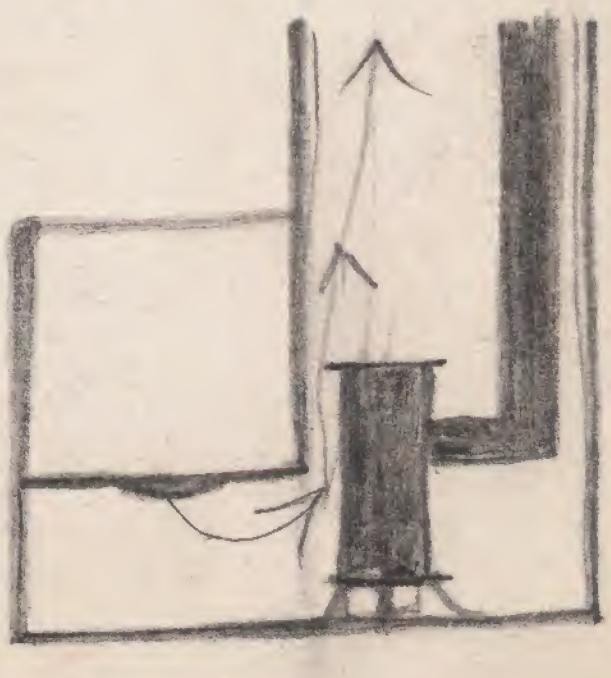

6


7


8
In
Out



Should the want of time at the Girls' High School for such an additional study be objected, since during the time of the instruction but little actual home study is required, I would take this objection as an additional argument in favor of giving the greatest scope and sway of application to a system which promises such reduction in time in others—their own proper studies in English. (See Abstract, "The Wrought Language," at end of book.)

Trusting that the volume may be received by the press with an interest somewhat commensurate with the very uncommon labors that have been bestowed to produce those results—as simplifications—which are either set forth in full or only sketched therein,

I am, very respectfully,

CH. C. SCHAEFFER.

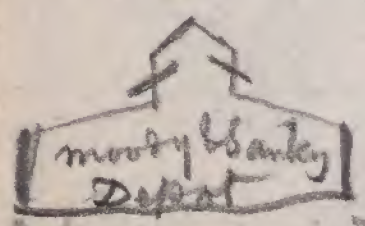
P. S.—As the High School Committee, so far as the introduction of German into the lower public schools is concerned, cannot act directly, I have thought best to mention what I suggested to those gentlemen to the people's representatives,—the newspapers,—so as possibly to aid the efforts, should any be made in the direction pointed out above, namely, of teaching German in all the American Schools by means of the "American System."—S.

PHILAD'A, *November* 9, 1875.

for out-door fresh air, many inlets — as in chamber, (already said)
except for convenience of construction.
where? above? below?
middle? Tried all in Paris Hospitals,
without decision.
accord to outlet —

Moreover, if coming from outside of an apartment is colder, it descends
^ this not common in use.
than that of the room,
best: If warmed descends, accept
~~So a fresh air place in a room may have 2 openings, one at the~~
~~all being one at the floor, letting air in at the upper one in winter, & the~~
~~lower in summer.~~
~~H. H. Hospital.~~

~~of upward air movement; opening close for warming, down outlet.~~
Downward ventilation: — sometimes especially appropriate:
Paris Dupleix and table
Dr. A. J. Bigelow ~~argument~~ autopsy table (Hosp. plans)
Leg water closet
Hosp. in Paris
downward, common, with heat shaft & chimney.



Rd 4 vent. of Crimea —
common in Surg. Gen. Hammond's Hospitals
~~Plans on board — dropped~~ i.e. Outlet.
Pneumatics
~~Mercury~~ water closet

Notes out

End of 18th Lecture, 1870.

→ Leeds' problems: cold across floor — hot across ceiling — hot up & across — warm below — down again out —

Outlets

Make sure that they are outlets; openings are not always so.

In winter, warmed houses, Without special heat — at

Eg: with heated shaft — may be below

Best — warmed air in at floor on one side — and out at floor the other, being compelled to go out by up-wind shaft with heat-current — as a chimney fire, — or in, middle, out both sides at floor.

So Mr Whitells improvement at Phila. Hospital — My floor small warming.

Mr. Phila. — Parker's —

~~Eg. Mr. Lists Hospital~~

~~Instance~~ — manufacture factory —

~~Edit. Club — Vapor typhus — invented~~

~~Original — [illegible]~~

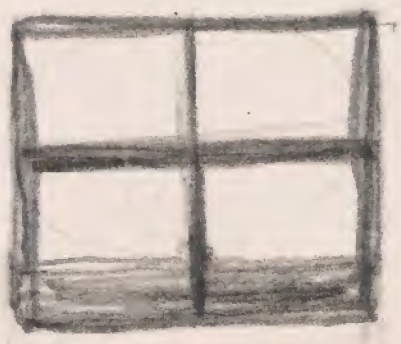
Manuel

[illegible]

(1

Muir ventilator (English or Scotch)

9 in



9 in

Cement down two openings & up two; the partitions going all the way through the flues to the room to be ventilated. Best at top of roof above it. —, Ventilates without fire.

Especially good for priories & ~~waterclosets~~ & vaults, where no fire is kept burning. The Wind drives in & out, or else aspirates out & in. This (I believe) must be its main dependence. Unequal, therefore.

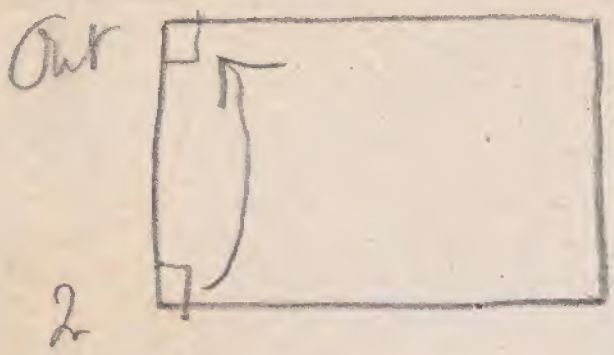
Robinson, Boston, Agent.

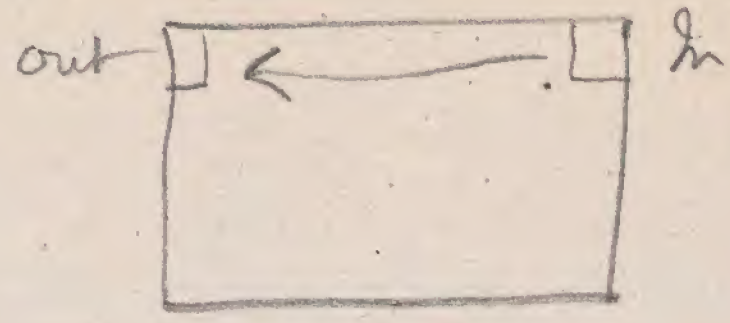
Addison Hutton thinks well of it.

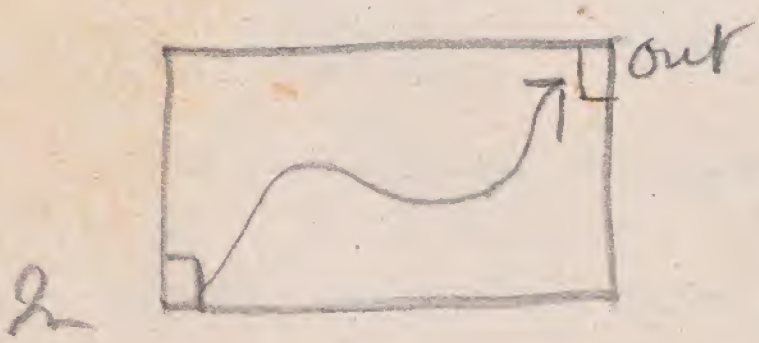
over

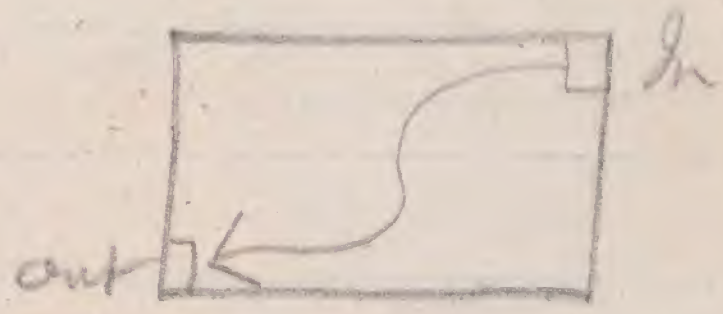
McKinnell's ventilator (Parkes)

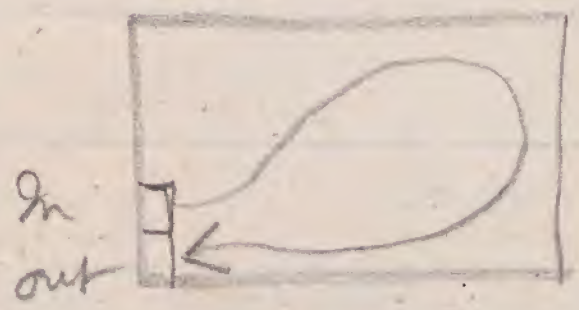
Inner tube higher; hood over it.
Area of inner tube & encircling ring equal.
If a fire in the room, close outer tube, inner being then outlet. Otherwise both inlets.
(Parkes)
If doors or windows open with it, both are outlets.
Best for round or square (not long) rooms. Size, from 5 or 6 in. for sitting room, to 7 or 8 feet for a church building.
Parkes says it answers well.

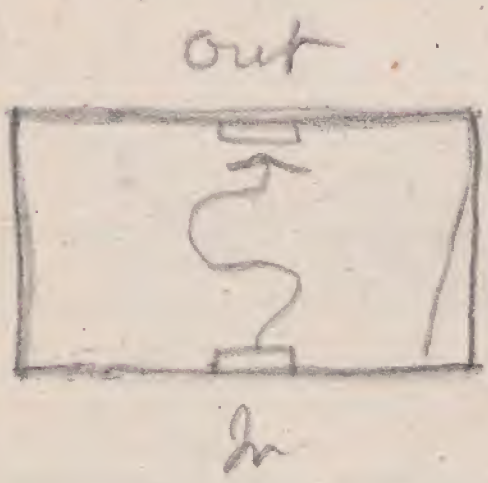


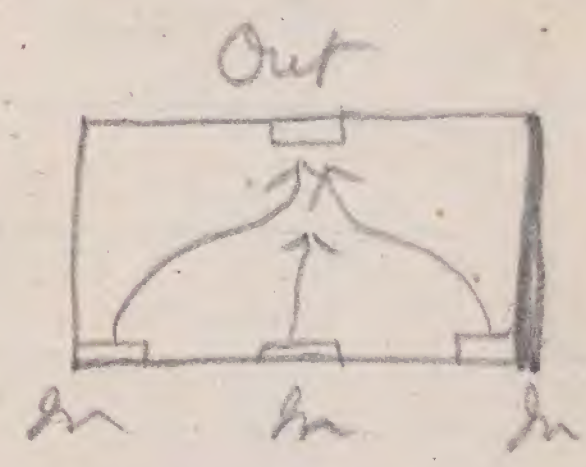






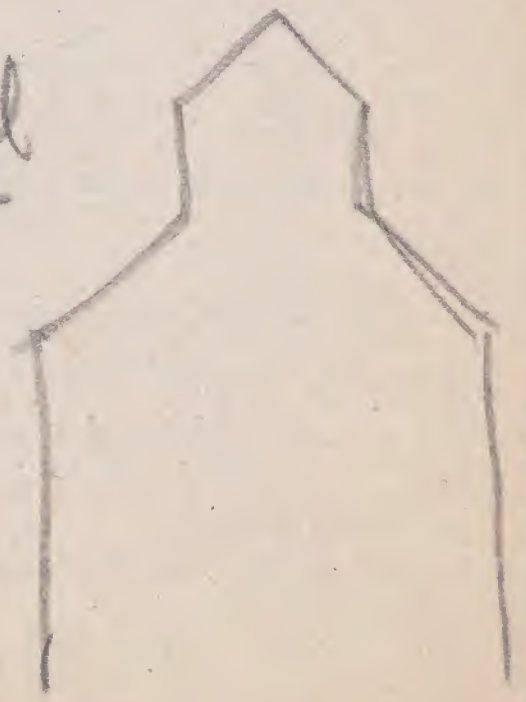


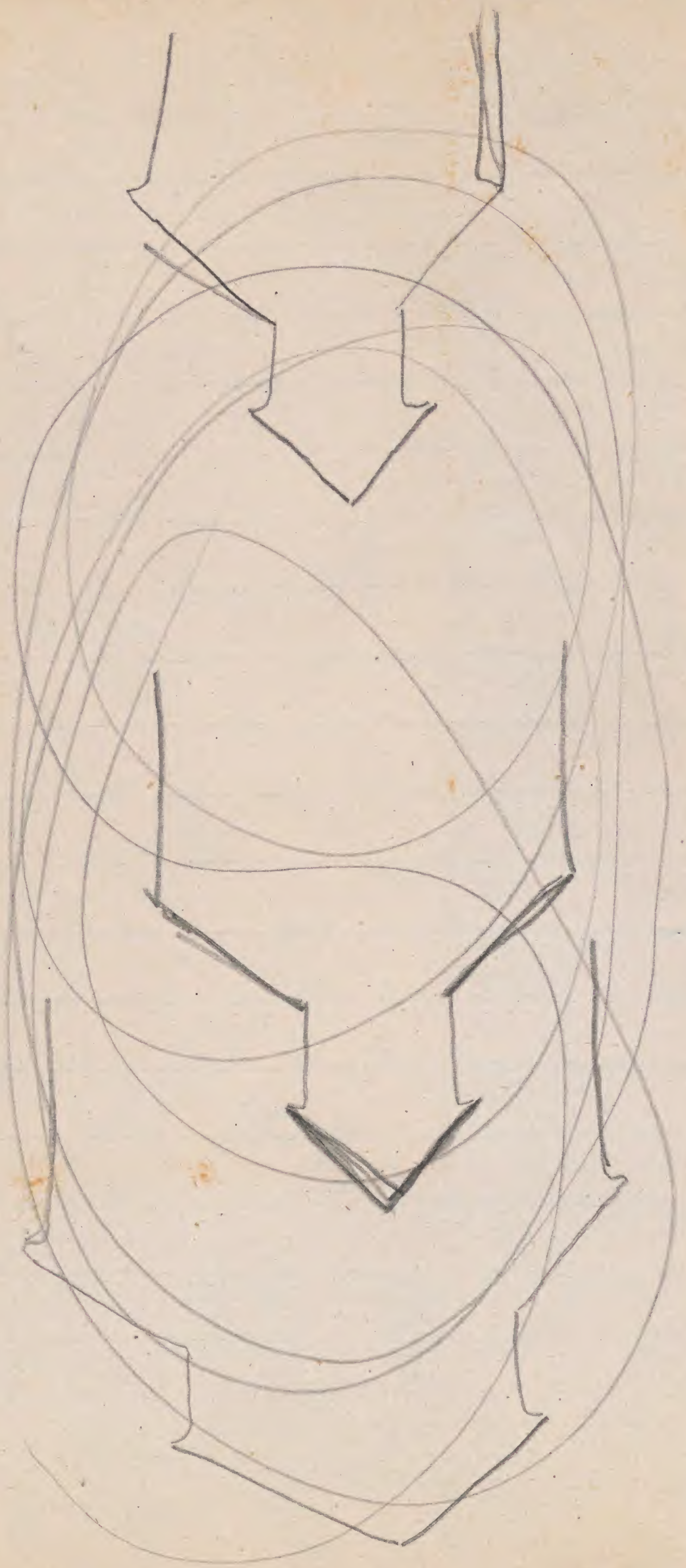




Ridge — & Centennial

ventilation





No 411 Broadway
New York Oct 11. 1879

Dr Henry Hartshorne
Germantown
Penna

Please find enclosed - description and cut of my - Universal ventilator =

A model may be seen at Mess Cummings & André 43 N 7th St. Philadelphia -

Yours truly
John S Hulse
per C. a L.

DESCRIPTION

—OF THE—

"UNIVERSAL" VENTILATOR,

—FOR—

FACTORIES, DWELLINGS, PUBLIC BUILDINGS, &c.

JOHN S. HULIN, 411 Broadway, N. Y.

Figure 1 of the drawings is a representation of a vertical central section of improved ventilator. Fig. 2 is a detailed side view thereof; and Fig. 3 is a horizontal section of the same. Fig. 4 is a detail, showing the notch.

This invention has relation to improvements in ventilators for houses, cars, and other places; and it consists in combining, with a flue leading into the place to be ventilated, a discharge flue, extending below the former and communicating with a number of spirally-arranged air-passages at the sides of the said ventilating flue, whereby a whirling current of air is created above the same, extending upward, which will draw the foul air up the lower flue, as will be hereafter more fully explained.

In the annexed drawings, the letter A designates the main ventilating-flue, the lower end of which extends down into the place—as a vault, car, or residence—to be ventilated. This flue tapers upward, and is of less diameter at top than at bottom, and it extends through the apex of a conical metallic disk or plate, B, of cast or sheet metal. C indicates the discharge flue, extending through the apex of a second metallic disk or plate, D, of the same size and construction as disk B. The flue C is of the form of an inverted cone, having a flaring upper end. Its lower end is of greater diameter than the flue A, and is on a level with it, as shown at *a*, Fig. 1, thereby forming an air passage, *b*, between the said flues, for a purpose hereafter explained.

The disks B D are spaced and connected together by means of spaced curved partitions *d*, terminating at their inner ends somewhat short of the main flue A.

When the conical disks are of cast metal, they will have curved ribs formed thereon, to which the upper and lower edges of the partitions *d* will be secured by rivets or bolts and nuts.

As shown in Fig. 3, the passages *e* between the partitions *d* flare outward. The air blowing through these passages forms a strong upward draft at the upper end of the main flue A, causing the foul air of the place ventilated to be carried up the discharge-flue into the open air. The upper end of the flue C is provided with a number of upturned horizontally-projecting hooks, *i*, that sustain a metallic capping G, of the form of a truncated cone, and extending after the manner of a penthouse, beyond the said flue. This capping is provided upon its edge with a notch, *x*, which readily permits it to be placed upon the hooks aforesaid and to be removed therefrom; but by turning the said cap until the hooks escape from the notch, the former bind upon the edge of the said capping, and hold it firmly in position. It may, however, be permanently secured to the tube A, if so elect. The apex of this capping is open, as shown at *h*, and is surmounted by a conical hood, J, spaced therefrom and connected thereto by rods *j*, the edges of which overlap those of the opening *h*. The passage of foul air is thus amply provided for, but the penetration of rain, snow, and other foreign matter is effectually prevented.

What I claim as new, and desire to secure by Letters Patent, is—

1. The ventilator device, consisting of the conical main flue A, the discharge flue C, forming therewith the air-passage *b*, the conical disks B D, having flaring curved partitions *d*, forming air-passages *e*, opening into passage *b*, and the overhanging capping G, substantially specified.

2. The combination, with the flue C, having projecting hooks *i*, of the capping G, having a peripheral notch or notches, substantially as specified.

☞ For drawings of above Ventilator see the other side.

Fig 3

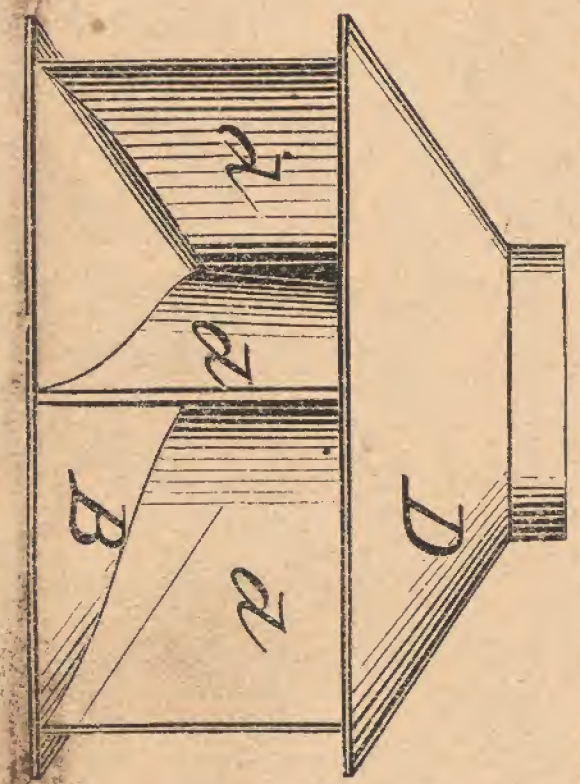


Fig 2

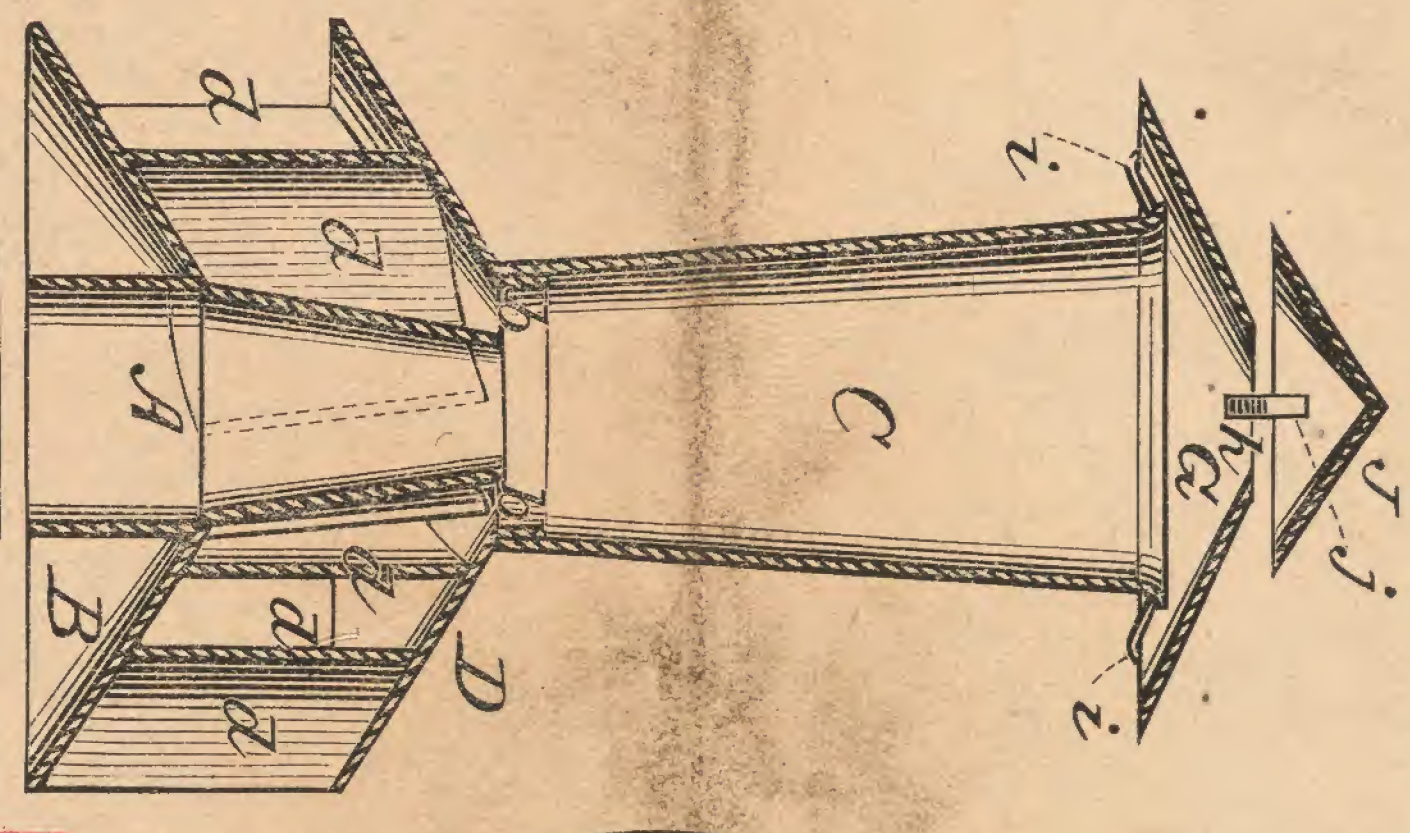


Fig 1

Fig 4

★ UNIVERSAL VENTILATORS ★

J. S. HULIN

PERFECT VENTILATION

For Dwellings, Schools, Churches, Theatres Public Buildings &c.

SOMETHING NEVER BEFORE ACCOMPLISHED!

All Impure Air Promptly Withdrawn.

No Necessity for Stifling, Confined Air in School-rooms, Offices or Public Buildings.

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J. S. HULIN, 411 Broadway, N. Y.

411 BROADWAY, N.Y.

★★ For Cars, Steamboats &c. ★★

Philada

Blockley, Hospital (1 ~~Not~~

~~Satterlee~~) I. m. substitute' dormer ventilator.

~~[illegible]~~ Steam heat, warm air flues;

open at floor one side — exit

flue at floor the other side, into a

having a draught from a fire below.

~~[illegible]~~ chimney, Ventilates best

when windows closed. Prny same —

best after closing ventil. flue above.

Perhaps stuff coats sleeches in

ventilators to keep out cold air!

~~Satterlee Hospital no attics & wards~~

~~but only kitchens & executive offices.~~

over

In a paper read ~~recently~~ (1873) before the Social Science Association in this city by the distinguished Dr. I. Ray, the ventilation of the Hospital at the Alms-house was remarked upon as incomplete; & this was sustained by two medical gentlemen present who were familiar with the Hospital. All admitted, however, — that the fault lies in the Construction of the buildings & the excessive number of patients; & that the ventilation was as good as the circumstances would allow, — & much better than before the present method of ventilation was introduced. My own impression of it has been mainly obtained from the accounts of it given by the President of the Board of Guardians, a very active and valuable member of the institution.

(Recapitulation)

Purely "natural" or spontaneous plans —

Chimney places —

Windows — Doors —

Nest —

Wind sails &

(mulgah) funnels at roof —

& tubes or shafts with cowls

or turncaps —

(anemometer)

(velocity of the wind from 1 mile per hour

to 120 or more miles per hour or

2 miles a minute —

8 or 9 per hour average.

— Anemometers —

Mixed plans — more artificial —

extraction by heated shafts —

as at Lavoisier — 1/2 of it by coils of steam pipe

In ~~temporary~~ Parliament —

~~[illegible]~~

& Principal Hospital of this city

Mines are well so

ventilated —

Ships, especially steamers,

may be so also — though sometimes

requiring more powerful mechanical aid —

~~If we only valued the importance~~

~~of removal of foul air, and for the~~

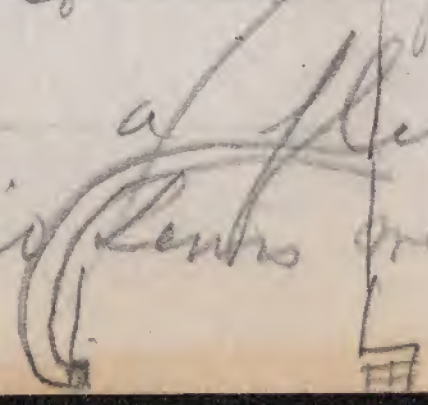
~~cleanest shed, first cause around them~~

~~in time, as we should, we might think~~

~~it worthwhile to have recourse in every~~

~~private house a flue on purpose~~

~~as in a plan Dr Dio Lewis mentions in his book~~



Summer ventilation of Hospitals needs fans —

(Dr Finkelstein Motor especially)

Artificial ventilation is by fans, exhausting or propulsive, or by pumps.

Désaguliers
Hales
Sylvester
Arnott
Reid
Duvoir
& van Hecke have especially tried & investigated these.

The circular fan may have its vanes straight or curved; may have the hub of the wheel (or spoke) at the outlet from the room to be ventilated, so that the rotation of the fan will suck the air out as it rotates — or

it may propel a draught of air into the room or building, the latter generally preferred

In E. Indies they simply had such a fan, called a thermantidote; much needed in India & China.

Our Acad of Music — Chestnut St Theatre & Kirkbride's new Hospital for Insane N. Asylum & Ulica N. Many other institutions are erected so

Fans of Dr Reid were from 10 to 15 or 20 ft diameter sometimes, large & moving slowly do the best.

Peclet a great French authority, declares for the fans against aspiration, or the Dictionary of Arts

Dr Ure says heat used for steam fans will change the air, for same fuel burned, 38 times as well as a ventilation shaft for extraction by upward current of air caused by heat.

Dr Parkes, however, considers that simplicity, greater equality, & safety, & economy of labor, are best met by heated shaft; & especially is this so

Tx Sarazin declares boldly that, in France, the hospitals which are the least well ventilated are those whose administration has expended considerable sums expressly for ventilation. Open fireplaces are, lately, being introduced into Parisian hospitals.

when the ~~Nourrice~~ apparatus of the bulb candle made to produce the ventilating upward currents; and half of Laibovicz for Paris.

Gen. Morin has ~~lately~~ shown that in that hospital in the 7th which has a fan, the movement of air occurring really is but 15 per ct due to the fan 85 per ct to natural or spontaneous ventilation.

For Paris, we may, I think, conclude, are only required —

1. In tropical climates —

2. In large vessels (ships or steamers), especially with more than one deck, & many passengers.

3. In great public buildings such as Houses of Parliament, theatres, halls & great collections of people, ~~at one time~~ suddenly & ~~

4. Large factories & other buildings, with many rooms, — so situated as not to afford good opportunity for natural ventilation.

Large Hospitals (Kirkbride) need this in summer time.

Dr Arnott believed in the exhausting or propelling pump as better than the fan; others do not agree with him. One of his pumps is a sort of moving gasometer, going by water power.

* March, 1876, air of House of U.S. Congress so horrible, that a Committee was appointed to investigate & remedy the trouble, to which several cases of illness were attributed.

One member said that they were being "murdered with scientific ventilation!" Much more probably, the proposed conditions for the use of the elaborate measures for ventilation were not maintained — through the common ignorance & negligence of subordinate officials concerned.

A New Idea about Ventilation.—How to purify sewers, and get rid of the pernicious effluvia which escape from them, is a subject which has baffled the invention and ingenuity of most civic bodies. M. Robinet, a French chemist, has devised a very effective means of freeing the sewers from them. His plan has already been carried out on a small scale. He proposes that the furnaces of factories shall derive their supply of air from the sewers; the latter will thus be emptied of their mephitic gases, which will be destroyed by combustion, fresh air from the atmosphere supplying their place. He calculates that if the combustion of only 70,000 tons of coal can be thus economized annually in Paris, or only one-tenth part of what is burned there, the sewers will be supplied with about 140,000,000 cubic feet of fresh air, that is, more than seven times their contents, daily.

generally were about a ¼ per
the second Board the market
at the last Board there was a
the leading descriptions. Mi-
rose to 115, on rumors of a 15
nd next month. Annexed are
tations on the street at 4½ P. M:
95 a ¼; Erie 87½ a ¾; Hudson
; Mich. Cen. 114¾ a 115; Mich.
a ½; Rock Island 111¼ a ⅜;
⅝: Fort Wayne 99 a 99½; Ohio
ficates 27¾ a 28; Canton 40¼ a
l 46½ a 46⅝; Mariposa M. C.
ksilver 49 a 49½; Central Coal

's.—The market for State and
r is 5 a 10 cents lower for com-
y firm for good grades. Sales
$7 40 a 7 75 for superfine State;
extra do.: 8 a 8 25 for choice do.;
for superfine Western; $7 90 a
on to medium extra Western.
. lower for Spring, and firmer
ales 60 000 bushels at $1 66 for
b, $2 for inferior amber West-
for very choice old amber Mi-
et at $1 for Western. Oats

New Houses of Parliament, in London,

— 2 towers, and 200 ft high, for supply of air — going in at a mean floor

Room heated separately — by open fires & heated flues — all chimneys & flues converging at one to a central chimney, 250 ft high —

*

Proposed by (Sir Pickford)

Tried in Belgium: but the committee pronounced it impracticable in

Some ways as not so much so

Sometimes take it at Chimney

How to ventilate best & most safely

a sleeping — (or living) apartment

by windows: (school-rooms — lecture-rooms &c)

1. several small openings — above & below.
curtains — furniture &c, between .. My cases of pneumonia, &c.
Habit important.

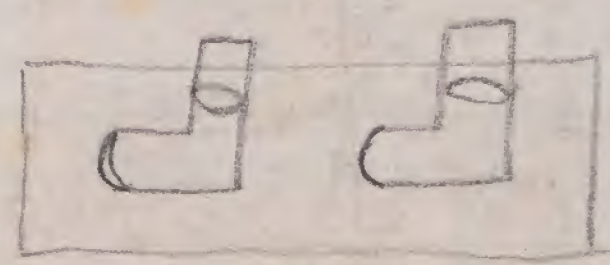
2. piece of wood under lower sash.

3. upsloping shelf or shingle, near open upper sash; or pane near top of window, hinged;

4. perforated zinc plate, or wire-gauze, for a pane.

5. best of all, double sash.

Maine's Window ventilators



The "UNIVERSAL" works on the ONLY PRINCIPLE by which Perfect Ventilation can be secured without Motive Power.

★ UNIVERSAL VENTILATORS ★

J. S. HULIN

PERFECT VENTILATION

For Dwellings, Schools, Churches, Theatres, Public Buildings, &c.

SOMETHING NEVER BEFORE ACCOMPLISHED!

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Correspondence solicited from School Boards and others who require Ventilators.

"UNIVERSAL"

HOUSE VENTILATOR,

FOR

DWELLINGS, SCHOOLS, CHURCHES, THEATRES, PUBLIC BUILDINGS, &c., &c.

OFFICE, 411 BROADWAY, NEW YORK.

John S. Hulin

Proprietor.

To Manufacturers using Steam Power, and Suffering from Insufficient Draught, we specially call attention to the letter from the well-known firm of HENRY C. MYER & CO., printed on the fourth page of this circular.

"Universal" House Ventilators.

The principle upon which this Ventilator is constructed causes the very lightest current of air (from any direction), to create a suction in the flue connecting it with the room to be ventilated,—the base of the Ventilator receiving the wind directly from any point of the compass.

There are no working, moving parts, hence there is no noise and no liability to get out of order.

The current of air entering at the base of the Ventilator, and escaping through the funnel, is made to first pass through spirally arranged air passages, surrounding the flue leading to the apartment to be ventilated. This whirling current creates a powerful upward draught through the ventilating flue, and draws off the heated, vitiated air from the room with which said flue is connected.

The double cap on the Ventilator protects the funnel from rain and snow, and the deflection of the hoods is such as to increase the draught created by the whirling current already mentioned, and to effectually prevent any BACK DRAUGHT.

These Ventilators, placed on heat-flues, prove a perfect cure for smoky chimneys.

They are in use extensively in New York City, Brooklyn, Jersey City, and in many other cities, and in every instance give entire satisfaction.

From the numerous TESTIMONIALS received, the following are selected:

Mr. URIAH WELCH, Proprietor of St. Nicholas Hotel, New York City, says:

NEW YORK, Nov. 15th, 1878.

Mr. JOHN S. HULIN.

Dear Sir:—We are greatly pleased with the results accomplished by using your Universal Ventilator in our Bake Rooms, and regard it as a perfect success.

DEPARTMENT OF PUBLIC INSTRUCTION,
OFFICE OF CLERK, SCHOOL NO. 5, BAY STREET.

J. S. HULIN, Esq. JERSEY CITY, Jan. 23d, 1879.

Dear Sir:—The following is a copy of a Report of the Committee on Heating and Ventilating, of the Board of Directors of Education of Jersey City, adopted Jan. 13th, 1879. Respectfully, &c.

MARTIN FINCK, *Clerk.*

JERSEY CITY, Jan. 13th, 1879.

HON. BOARD OF DIRECTORS OF EDUCATION.

Gentlemen:—Your Committee respectfully report that they have placed in one of the rooms of School Building No. 6, one of the "Universal" Ventilators, which has given perfect satisfaction. In view of the presentation of Bill for same by the Proprietor, Mr. JOHN S. HULIN, this Committee report that they have carefully examined the work, and inquired into results obtained. That they cannot improve upon the Report of the Principal, Mr. J. W. WAKEMAN, who endorses the Bill—"The Ventilator works to a charm." Respectfully submitted.

PETER SCANLAN,
CHARLES H. MOORE, } *Committee.*

JERSEY CITY, Jan. 21st, 1879.

JOHN S. HULIN, Esq.

Dear Sir:—The "Universal" Ventilator which you placed in my Class Room, No. 24, School Building No. 6, Jersey City, gives entire satisfaction. IT THOROUGHLY VENTILATES A ROOM WHOSE PECULIAR LOCATION RENDERED IT ALMOST IMPOSSIBLE TO OBTAIN ANY VENTILATION WHATEVER. You have so arranged your registers as to produce the most perfect diffusion of fresh air without sensible draughts.

Respectfully yours,

J. W. WAKEMAN, *Principal Public School No.* 6.

SOUTHWORTH COMPANY,
MANUFACTURERS OF WRITING AND LEDGER PAPERS.

MITTINEAQUE, MASS., March 19th, 1879.

JOHN S. HULIN, Esq., 411 Broadway, New York.

Dear Sir:—The Universal House Ventilator you recently placed in our Rag Room, meets our full expectation, and it affords us pleasure to recommend it to all who feel the importance (as we did), of relieving our Rag Room of the unpleasant dust that the dusting and cutting of rags occasions. Yours truly,

SOUTHWORTH COMPANY,
WELLS SOUTHWORTH, *President.*

OFFICE OF THE CAREW MANUFACTURING CO.,
SOUTH HADLEY FALLS, MASS., MAY 5, 1879.

Mr. JOHN S. HULIN, Esq.,

Dear Sir:—"We put on your Ventilator on the first day of this month. I must say, that it works the best of anything we ever used, and if it continues to work as well as it has, I think you will sell a good many in Holyoke." Yours truly,

J. CAREW, *Agent.*

The Universal Ventilators are also used to increase draught for Boilers, and saves more than the cost of them in fuel.

JOHN S. HULIN, Esq.

Dear Sir:—We have much pleasure in stating that the "Universal" Ventilator which you placed on our flue has proved a success.

Before you put it on, we were continually annoyed by lack of draught and inability to get the proper power steadily out of our engine; now we seem to have a good draught all the time, and no trouble to keep up steam, AND SAVE DAILY ABOUT 25 PER CENT. OF THE FUEL WE FORMERLY USED. We cheerfully recommend the Ventilators to those situated as we were. Respectfully,

HENRY C. MYER & Co.,
46 & 48 CLIFF ST.

NEW YORK, Feb. 3, 1879.

Mr. JOSEPH POOL, President Manufacturers' and Merchants' Bank, 527 Broadway, New York City, says:

NEW YORK, Nov. 14th, 1878.

Mr. JOHN S. HULIN, 411 Broadway.

Dear Sir:—I received your letter, making inquiry about the "Universal Ventilator" which was put in our Banking Room some four months ago.

I am well pleased with the good it has done in ventilating our room.

Our employees, who remain in the Bank nights as well as days, speak of the great relief from impure air, since we have had the Ventilators.

PRICE LIST.

No. 1—4 in. diameter, ... $12 00

No. 2—5 " " 15 00

No. 3—6 " " 18 00

No. 4—8 in. diameter, 3 ft. high, . . . 20 00

This size is frequently placed on smoke flues having defective draught.

No. 5—10 in. diameter, 3½ ft. high, . . . 25 00

No. 6—12 in diameter, 4 ft. high, . . . 30 00

Adapted to ventilating dewlling apartments.

No. 7—16 in. diameter, 4½ ft. high, . . . 40 00

No. 8—20 in. diameter, 5 ft. high, . . . 45 00

Of proper size for Bank Offices, Court Rooms, etc.

No. 9—24 in. diameter, 6 ft. high, . . . 50 00

Applied to ventilation of Public Buildings, Theatres, Schools and Concert Rooms.

No. 7, 8 and 9 are also used in the ventilation of Steamships, and of Vessels employed in transportation of meats, fruits, etc,

We can make these Ventilators to fit any flue. The smaller sizes, 4, 5 and 6 inch diameter are used principally for Chimney Caps.

SPECIAL SIZES can be made to order.